

# Margarita M. Solares-Colón

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**Seismologist & Geodesist:** PhD candidate in earthquake science (graduating 2025) with expertise in geophysical data analysis, seismic network operations, and rupture modeling using seismic and geodetic data. Committed to improving response workflows and decision-making, with a strong interest in analyzing geophysical datasets and a strength in turning technical results into impactful visualizations. Fluent in Spanish (native) and English (proficient speaking/writing).

**Research interests:** geophysics, earthquake seismology, kinematics and dynamics of plate tectonics, geological hazards and management

**Computer skills:** Operative Systems: Macintosh, Linux, and Windows; Programming languages: Python; Experience in command-line interface and shell scripting.

## EDUCATION

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**Ph.D. in Earth Sciences, University of Oregon, Eugene (expected 2025).** Recipient of the Graduate School Promising Scholar, University of Oregon, 2021-2022. Dissertation: "Modeling Moderate to Large Earthquakes: Applications in Source Characterization and Early Warning Systems", Advisor: Dr. Diego Melgar-Moctezuma

**M.S. in Geology, University of Puerto Rico, Mayagüez (2019).** Thesis: "New Constraints on Crustal Deformation Within the Puerto Rico–Virgin Islands Microplate with Two Decades of GPS Data", Advisor: Dr. Alberto López-Venegas

**Graduate-level Professional Development, University of Puerto Rico, Mayagüez (2013).** Completed additional coursework equivalent to a B.S. in Geology

**B.A. in Physical Geography and Technology Applications (GIS and Remote Sensing), University of Puerto Rico, Río Piedras (2012).** Magna Cum Laude. Research: "Impact on Karst Zone, Arecibo, Puerto Rico: Land Use and Soil Classification Using Remote Sensing". Advisor: Ángel David Cruz-Báez

## RESEARCH AND PROFESSIONAL EXPERIENCE

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Jun 2022 – Sep 2023      **Pathways Intern | U.S. Geological Survey, Golden, Colorado**  
Supervisors: Dara Goldberg and William Yeck

- Contributed to improving the National Earthquake Information Center (NEIC) finite-fault model database by integrating seismic and geodetic observations for major global earthquake events.
- Learned, applied, and adapted the Wavelet and simulated Annealing SliP (WASP) code to develop and refine finite-fault models, with outcomes integrated into my doctoral dissertation research.

Nov 2019 – Jul 2021      **Research Assistant I | Puerto Rico Seismic Network, Geology-UPRM**  
Supervisor: Victor Huérfano and Gisela Báez

- Reviewed and processed geophysical data for local and regional earthquakes detected by seismic stations monitored by the Puerto Rico Seismic Network.
- Prepared and disseminated reports and alerts for felt earthquakes in Puerto Rico and tsunamis affecting Puerto Rico and adjacent regions within our area of responsibility.
- Collaborated on GPS Network maintenance projects and the integration of the Advanced National Seismic System (ANSS) Quake Monitoring System (AQMS) into operational workflows.

## PUBLICATIONS

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**Solares-Colón, M. M.**, Melgar, D., et al. (2025; *work submitted to Seismica*). Using ruptures from earthquake cycle simulators to test geodetic early warning systems performance.

**Solares-Colón, M. M.**, Goldberg, D. E., Melgar, D., Vanacore, E. A., Sahakian, V. J., Yeck, W. L., & López-Venegas, A. M. (2025). Slow rupture, long rise times, and multi-fault geometry: The 2020 M6.4 southwestern Puerto Rico mainshock. *Geophysical Research Letters*, 52. [View](#)

López-Venegas, A. M., Mattioli, G. S., **Solares-Colón, M.**, Mencin, D., & Jansma, P. E. (2022). Estimating coseismic deformation of southwestern Puerto Rico from the 7 January 2020 Mw 6.4 earthquake: Constraints from campaign and continuous GPS. *Bulletin of the Seismological Society of America*, 113(1), 99–114. [View](#)

## RECENT CONFERENCES

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- Apr 2025    **European Geophysical Union (EGU) General Assembly, Vienna, Austria**  
Poster Presentation “Towards systematic kinematic source models of historically large earthquakes”.
- Apr 2023    **Seismological Society of America (SSA) Annual Meeting, San Juan, Puerto Rico**  
Poster Presentation “The M6.4 Mainshock in the 2020 Southwestern Puerto Rico Seismic Sequence: New insights from Joint Inversion”. (Received SSA Travel Grant)
- Dec 2022    **American Geophysical Union (AGU) Fall Meeting, Chicago, IL**  
Oral Presentation “Source Characterization of the M6.4 Mainshock in the 2020 Southwestern Puerto Rico Seismic Sequence with Seismic and Geodetic Observations”.
- Apr 2022    **Seismological Society of America (SSA) Annual Meeting, Bellevue, WA**  
Poster Presentation “Generation and Validation of Synthetic HR-GNSS Data for New Zealand Megathrust Rupture Scenarios”.

## RECENT WORKSHOPS

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- May 2025    **Seafloor Geodesy Future PI Workshop, Bloomington, MN:** Preparing early career researchers to design and propose seafloor geodetic experiments.
- Oct 2024    **Earthquakes: Nucleation, Triggering, Rupture, and Relationships to Aseismic Processes – 4th Edition, Cargèse, Corsica, France:** International workshop on earthquake science, which combined lectures by leading researchers in the field with tutorials and group discussions.
- Jun 2021    **Remote Online Sessions for Emerging Seismologists (ROSES):** Summer course consisting of 11 online sessions related to seismology applications.

## FIELD EXPERIENCE

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- Jun 2018    **US-China Collaboration on Landslide Research and Student Training:** International Research Experience for Students (IRES) program hosted by the University of Houston (UH) in U.S. and the China University of Geosciences (CUG-Wuhan) in China funded by the NSF Award (OIA:1460034).
- Mar 2016    **Miocene-Pliocene Carbonates Complexes of Southeast Spain Field Trip:** International field trip with the University of Kansas (KU) and University of Puerto Rico, Mayagüez (UPRM) (Received ExxonMobil Diversity Grant for UPRM).